

# Plumbing and related Basic Terms

## INTRODUCTION

Plumbing is a skill which helps in the installation of bathroom and kitchen fittings, laying of new pipelines in buildings and identifying the defects in pipeline. The plumbing system includes two main systems—the water supply and the drainage system. Why is the plumbing system necessary for every construction project? Whether a small or big construction, proper planning and designing of the plumbing system helps in maintaining the hygiene requirements of the occupants and acts as a safeguard against illness. It has been reported that 8 per cent of the total construction cost of the building is marked for plumbing and sanitary work.\*

In order to understand plumbing and its work process, it is important to understand some key terms. A knowledge of these terms will help the Plumber General in the preparation and estimation of one's work and also in understanding the assembly sheet of the plumbing fixtures in the manufacturer's catalogue.

### A

#### Air gap

The distance between the lowest point of a water inlet or pipe to a tank and the overflowing level of the tank

\* B.N. Dutta.1997. *Estimating and Costing in Civil Engineering: Theory and Practice*. UBS Publishers' Distributors Ltd., New Delhi.

## NOTES

### AC pipes

Asbestos-Cement pipe used in water distribution systems

### Appliance

A container or apparatus in which water is heated, treated or measured, or in which it is utilised before passing to waste

### Auger

A tool having a rotating helical screw blade used for drilling a hole

### Available head

The head of water available at the point of consideration due to main's pressure or overhead tank or any other source of pressure

## B

### Backflow

It is an unwanted flow of water in the reverse direction. It leads to wastage of water and it is due to leakage or defect in the system.

### Backflow prevention device

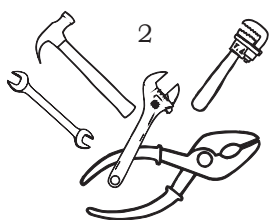
This device is fitted in such a way that allows water to flow in one direction but never in the opposite direction. Its sole job is to prevent drinking water from being contaminated due to backflow.

### Back siphonage

The flowing back of used contaminated or polluted water from a plumbing fixture or vessel into a water supply pipe due to a reduced pressure in such a pipe.

### Bathroom vanity

It can be defined as the combination of the bathroom sink or basin and the storage that surrounds it.



## Bidet

It is a special plumbing fixture that allows a person to use water to wash their genitals, anus, and inner buttocks after using the bathroom. These fixtures are very popular with both men and women in developed countries.

## Branch

Any part of the piping system other than a main pipe is known as branch

### Branch soil pipe (BSP)

A pipe connecting one or more soil appliances to the main soil pipe

### Branch soil waste pipe (BSWP)

A pipe connecting one or more soil and/or waste appliances to the main soil waste pipe (one-pipe system)

### Branch ventilating pipe (BVP)

A pipe, one end of which is connected to the system adjacent to the trap of an appliance and the other to a main ventilating pipe or a drain-ventilating pipe. It is fitted to prevent loss of water seal from a trap, owing to partial vacuum back pressure, or surging caused by air movement within the pipe system. It also provides ventilation for the branch waste pipe.

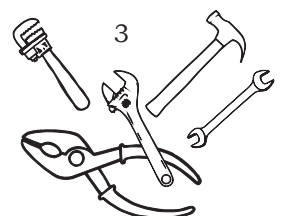
### Branch waste pipe (BWP)

A pipe connecting one or more waste appliances to the main waste pipe

## Building drain

The building (house) drain is the part of the lowest horizontal piping of a drainage system which receives the discharge from soil, waste, and other drainage pipes inside the walls of the building. It carries the discharge to the building (house) sewer beginning one metre outside the building wall.

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## NOTES

### Building sewer

The building (house) sewer is the part of the horizontal piping of a drainage system which extends from the end of the building drain and which receives the discharge of the building drain and carries it to a public sewer, private sewer, individual sewage-disposal system, or other point of disposal.

### Burr

It is a raised edge or a small piece of material remaining attached to a workpiece after a modification process. It is usually an unwanted piece of material and is removed with a de-burring tool in a process called deburring.

## C

### Cistern

A tank for storing water, especially one supplying taps or as part of a flushing toilet

### Cleaning eye

When removable plug is fitted with removable cover into the pipe fitting as eye opening and clearing of obstructions is done through this opening, it is called access eye or cleaning eye.

### Couplers

When we connect two pieces of uniform or varying diameter pipe, a piece of pipe known as coupler is used for joining these pipes. One end of a coupler may be of a higher or lower diameter size as per requirement.

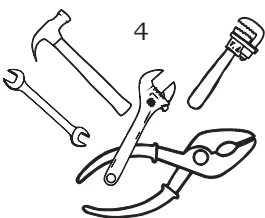
### Crown of trap

The top-most point of the inside of a trap outlet.

## D

### Diameter

Unless specifically stated, the nominal diameter of pipe fittings



## Direct tap

A tap or faucet, which is connected to a supply pipe and subject to pressure from the water main

## Domestic purposes

All purposes incidental to the occupation of a dwelling

## Downtake tap or faucet

A tap or faucet connected to a system of piping, not subject to water pressure from the water main

## Drain water outlet

Any pipe which conveys discharges from sanitary appliances in a drainage system.

## Drain ventilating pipe (DVP)

It is a pipe installed to provide flow of air to or from a drain to prevent undue concentration of foul air in the drain. The main soil pipe or main waste pipe may serve as drain ventilating pipe wherever its upper portions, which do not receive discharges, are extended to the roof level and let open to the air.

## Dwelling

It is a building—used, constructed or adapted for use, wholly or principally for human habitation. It may include garages, other outhouses, etc.

## E

## Escutcheon

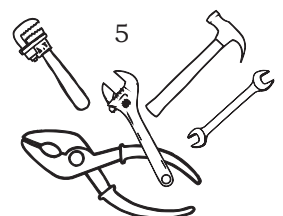
A flat piece of metal for protection and often ornamentation, around a keyhole, door handle, or light switch

## F

## Fitting

It refers to the fixtures in the plumbing system to join straight pipes or any section of tubes. Examples include elbow, tee, socket, reducer, etc.

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### Fixture unit

A quantity, in terms of which the load producing effects on the plumbing system of different kind of plumbing fixtures are expressed on some randomly chosen scale

### Flange

It is a plate or ring to form a rim at the end of a pipe when fastened to the pipe. A flange joint is a connection of pipes, where the connecting pieces have flanges by which the parts are bolted together.

### Float operated valve

Ball valves or ball taps and equilibrium by valves operated by means of a float

### Floor area of a building

The area of a horizontal section taken at the plinth or floor level of any storey of a building, inclusive of all projecting and overhanging parts of the external walls, and of such portions of the partition walls as belonging to the building

### Flushing cistern

It is a cistern with a device for rapidly discharging the contained water. It is used in connection with a sanitary appliance for the purpose of cleansing the appliance and carrying away its contaminated contents into a drain.

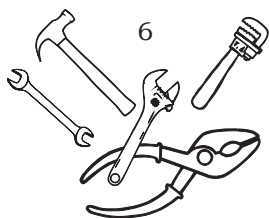
### Fracture

Due to heavy pressure or clogging, there is broken or cracked portion in plumbing pipes, fixture or fittings, due to which leakage takes place.

## G

### Gasket

Mechanical seals, generally ring-shaped and fitted for sealing flange joints



## General washing place

A washing place provided with necessary sanitary arrangement and common to more than one tenement, that is a multi-occupancy building of any sort

## H

### Horizontal pipe

Any pipe or fitting which makes an angle of more than 45° with the vertical

## I

### Induced siphonage

The extraction of water from a trap by a siphonage set up by the reduction of pressure at the outlet of the trap

### Insanitary

Contrary to sanitary principles or injurious to health

## M

### Main soil pipe (MSP)

A pipe connecting one or more branch waste pipes to the drain

### Main soil waste pipe (MSWP)

A pipe connecting one or more branch soil waste pipes to the drain

### Main ventilating pipe (MVP)

A pipe which receives a number of branch ventilating pipes

### Main waste pipe (MWP)

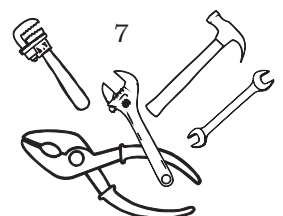
A pipe connecting one or more branch waste pipes to the drain

## N

### Nipple

It is a piece of pipe having thread at both sides, and could be used for short extension of plumbing lines.

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It can also be used for connecting two fittings within a short distance.

### O

#### O-ring

An O-shaped ring that is attached to the faucet to prevent water from oozing out of the spout

### P

#### Period of supply

The period of the day or night during which water supply is made available to the consumer

#### Pipe ears

Two wings cast integrally with the pipe socket provided with holes to take fixing nails or screws

#### Pipe systems

It is an assembly of various components put together with a method of joints, to transport water from the source to destination. The system to be adopted will depend on the type and planning of the building in which it is to be installed and will be one of the following.

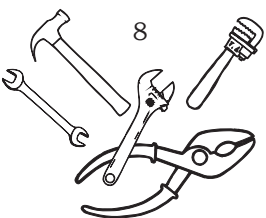
1. *One-pipe system*— The plumbing system in which the waste connection from washbasins, baths, and the soil pipe branches are all collected into one main pipe which is connected directly to the drainage system. Gully traps and waste pipes are completely dispensed with but all the traps of water closets, basin, etc., are completely ventilated to preserve water seal.

2. *Two-pipe system*— It is a discharge pipe system comprising two independent discharge pipes, one of which conveys soil directly to the drain, the other conveying waste water to the drain through a trapped gully. The system may also require ventilating pipes.

3. *Single stack system*— One-pipe system without trap ventilation pipework

#### Pipework

Any installation of piping with its fitting





## Plinth

The portion of a structure between the surface of the surrounding ground and surface of the floor, immediately above the ground

## Plumbing

It is the pipes, fixtures and other apparatus inside a building for bringing in the water supply and removing the liquid and water-borne wastes;

It is the installation of the foregoing pipes, fixtures and other apparatus.

## Plumbing system

It shall include the water supply and distribution pipes; plumbing fittings and traps; soil, waste, vent pipes and anti-siphonage pipes; building drains and building sewers including their respective connections, devices and appurtenances within the property lines of the premises and water-treating or water-using equipment.

## Plunger

A tool for cleaning normal blockage in drain and pipe, washbasin, etc.

## Potable water

Water which is satisfactory for drinking, cooking and domestic purposes and meets the requirements of the Bureau of Indian Standards (BIS)

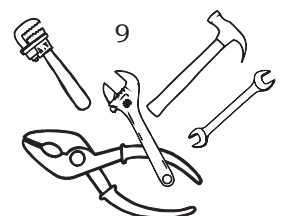
## Premises

It shall include passages, buildings and lands of any tenure, whether open or enclosed, whether built on or not, and whether public or private in respect of which, a water rate or charge is payable to a designated authority or for which an application is made for supply of water

## Public building

A building used or intended to be used either ordinarily or occasionally as a church, temple, mosque or any

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place of public worship, *dharamshala*, college, school, theatre, cinema, public concert room, public hall, public bath, hospital, hotel, restaurant, lecture room or any other place of public assembly

### S

#### Sealing rings

It is a type of gasket used in connecting any fixture or joints to create leak proof condition.

#### Self-siphonage

The extraction of water from a trap by siphonage, setup by the momentum of the discharge from the sanitary appliance to which the trap is attached

#### Service pipe

The pipe that runs between the distribution main in the street and the riser in case of a multi-storeyed building, or the water in case of an individual house, and is subjected to water pressure from such a main

#### Soil pipe (SP)

The pipe used to carry waste from the toilet and waste water

#### Spindle

It is a metal unit that provides the link between the handle and the stem washer.

#### Stack

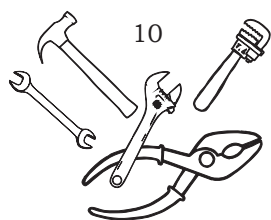
The main vertical discharge or ventilating pipe

#### Stopcock

A cock fitting in a pipeline for controlling the flow of water

#### Stop tap or faucet

It includes stop cock, stop valve or any other devices for stopping the flow of water in a line or system of pipe at will.



## Storage cistern

A cistern for storing water

## Stuffing box

It is an assembly which is used to house a gland seal. It is used to prevent leakage of fluid, such as water or steam, between sliding or turning parts of machine elements.

## Sullage

The waste water generated from bath and kitchen (but not the waste water from toilets known as excreta)

## Supply pipe

The pipes which lead from the distribution main of water supply to the plumbing system of the house

## Supports

Devices for supporting and securing the pipe and fittings to the walls, ceilings, floors or any extra constructed unit

## T

## Trap

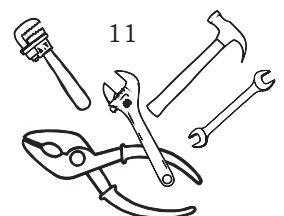
A fitting or device in a P-, U-, S- or J-shaped type. Traps are fitted near a plumbing fixture. The trap bend is fitted to prevent sewer gases from entering the building. It is so designed and constructed as to provide, when properly vented, a liquid seal which will prevent the back passage of air without materially affecting the flow of sewage or water through. If the gases are inserted back into home, then it could lead to people inhaling foul smell, which could cause illnesses. It could even explode.

## V

## Vertical pipe

Any pipe which is installed in a vertical position or which makes an angle of not more than  $45^\circ$  with the vertical

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## W

### Warning pipe

An overflow pipe so fixed that its outlet, whether inside or outside a building, is in a visible position where the discharge of any water from it can be readily seen

### Washout valve

A device located at the bottom of the tank for the purpose of draining a tank for cleaning, maintenance, etc.

### Water line

A line marked inside a cistern to indicate the highest water level at which the supply valve should be adjusted to shut off

### Water main (street main)

It is a pipe laid by the water undertakers for the purpose of giving a general supply of water as distinct from a supply to individual consumers. It includes any apparatus used in connection with such a pipe.

### Water outlet

As used in connection with the water distributing system, it is the discharge opening for the water (1) to a fitting; (2) to atmospheric pressure (except into an open tank which is part of the water supply); and (3) to any water-operated device or equipment requiring water to operate.

### Water seal

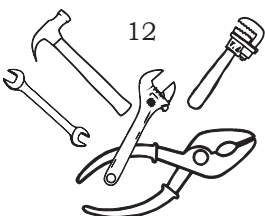
The water in a trap which acts as a barrier to the passage of air through the trap

### Water supply system

It consists of the water service pipe, the water-distribution pipes, and the necessary connecting pipes, fittings, control valves, and all fixtures in or adjacent to the building or premises.

### Water undertaker

The water service provider who owns the supply system and infrastructure and provides water to a defined geographic area



## Waterworks

It refers to an establishment for managing a water supply. Waterworks for public water supply include a lake, river, spring, well, pump with or without motor and accessories, reservoir, cistern, tank, duct whether covered or open, sluice, water main, pipe.

## NOTES

### Practical Exercises

#### Activity 1

Identify whether your home has a one- or two-pipe discharge system.

##### Material required

1. Notebook
2. Pen
3. Paper

##### Procedure

1. Identify the discharge pipe fitted in your home.
2. Check whether one or two pipes are being used as discharge pipe.
3. Prepare a note on this observation.
4. Discuss with your teacher.

#### Activity 2

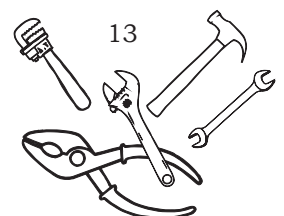
Visit a school building and identify the various plumbing fittings being used.

##### Material required

1. Notebook
2. Pen
3. Paper

##### Procedure

1. Make a list of various plumbing items and fittings fitted in your school.
2. Identify the various fittings used.
3. Prepare a note on this.



## NOTES

## Check Your Progress

### A. Define the following terms

1. Crown of trap
2. Diameter
3. Drain water outlet
4. Water supply system
5. Flushing cistern

### B. Multiple choice questions

1. A building used or intended to be used either ordinarily or occasionally as a church, temple or mosque square is
  - (a) premises
  - (b) public building
  - (c) residential building
  - (d) commercial building
2. The main pipe used for vertical discharge, or the ventilating pipe is
  - (a) stack
  - (b) service pipe
  - (c) one pipe system
  - (d) None of these
3. A device for rapidly discharging the contained water and used in connection with a sanitary appliance is
  - (a) float
  - (b) flushing cistern
  - (c) siphon
  - (d) trap
4. The distance between the lowest point of a water inlet or feed pipe to an appliance and the spill-over level is
  - (a) air gap
  - (b) head
  - (c) back flow
  - (d) None of these

### C. Fill in the full forms of the given abbreviations

1. MSP \_\_\_\_\_
2. MVP \_\_\_\_\_
3. MWP \_\_\_\_\_
4. MSWP \_\_\_\_\_

